

EPO-DG I

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Claims

(44)

1 ^A Method for making a semiconductor device having a pattern of highly doped regions (6,6') located some distance apart in a semiconductor substrate (1) and regions (7, 7', 7'') of low doping located between the highly doped regions (6, 6'), wherein

- a doping material (2) is applied to the substrate, at least in the location of the highly doped regions,
- the substrate is subjected to a diffusion step in which atoms diffuse from the doping material into the substrate, and
- conducting contacts (8, 8') are made above the highly doped regions, characterized in that

before the diffusion step a diffusion barrier material (5, 5', 5'') is applied to the substrate substantially exclusively at the location of the regions (7, 7', 7'') of low doping by imprinting with the barrier material (5, 5', 5'') in the pattern of the regions of low doping, the doping material (2) being applied in a substantially continuous layer over the substrate (1).

2. ^A Method according to Claim 1, characterized in that the barrier material (5, 5', 5'') is first applied to the substrate (1), after which the doping material (2) is applied.

Q/ 3 Method according to Claim 1 or 2 characterized in that the doping material (2) is first applied to the substrate, after which the barrier material (5, 5', 5'') is applied to the substrate on the doping material (2)

4. Method according to one of the preceding claims, characterized in that the diffusion barrier material (5, 5', 5'') is a dielectric material in paste form that is sintered after being applied to the substrate (1).

5 Method according to Claim 4, characterized in that doping material has been added to the barrier material.

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Q2 6. Method according to one of the preceding claims, characterized in that the surface resistance of the highly doped regions is between 10 and 60 ohm square and the surface resistance of the regions of low doping is between 30 and 500 ohm square.

7. Method according to Claim 6, characterized in that the concentration of the doping material in the highly doped regions is between 10^{18} cm^{-3} and 10^{21} cm^{-3} , whilst the diffusion depth is between $0.1 \text{ }\mu\text{m}$ and $0.5 \text{ }\mu\text{m}$, and in that the concentration of the doping material in the regions of low doping is between 10^{17} cm^{-3} and 10^{21} cm^{-3} for a diffusion depth of between $0.1 \text{ }\mu\text{m}$ and $0.5 \text{ }\mu\text{m}$.

Q3 8. Method according to one of the preceding claims, characterized in that an etching material is added to the diffusion material (5, 5', 5'') to etch away the substrate.

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